Olive Wellness INSTITUTE™

The Olive Leaf – An Ancient Health Remedy

Overview for Healthcare Professionals

August 2018

INTRODUCTION

The olive tree (Olea europaea) is a fruit tree that has a long history of reported health benefits. Products of the olive tree have been used widely in folk medicine in Mediterranean countries.

ABOUT

Most people across the globe are familiar with the health benefits of olive oil. However, there is also another key part of the olive tree that has many reported medical applications and therapeutic activity – the olive leaf. The olive leaf has been used as a health remedy for many centuries, dating back to the Ancient Egyptians. The Bible references the use of olive leaf in medicine – "the fruit thereof shall be for meat, and the leaf thereof for medicine."

In more recent years, there is a growing body of scientific evidence evolving that demonstrates the clinical effectiveness of the olive leaf for a variety of diseases and conditions.

Olive leaf has been incorporated in the diet as an extract, tea and powder (in consumable products and cosmetic preparations). The leaf contains a wide variety of bioactive compounds that are beneficial for health and wellness.[1,2]

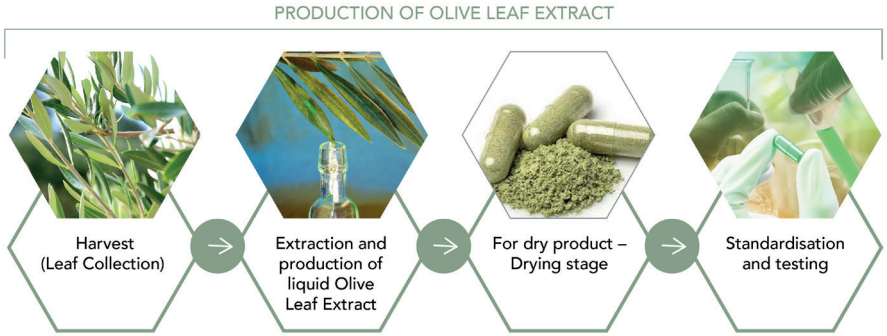
The olive leaf contains a wide phenolic profile, of which the major elements are shown below:

- Oleuropein
- Hydroxytyrosol
- Rutin
- Catechin
- Luteolin
- Diosmetin
- Caffeic acid
- Verbascoside
- Vanillic acid
- Tyrosol
- Vanillin

The two most prominent biophenols found in olive leaf extract are oleuropein and hydroxytyrosol.[1]

OLIVE LEAF EXTRACT

Olive leaf extract is a supplement that is derived from the olive leaf, which contains bioactive compounds that provide a health and wellness tonic that has many researched health benefits. The extract contains a wide variety of compounds which work synergistically to deliver a multitude of therapeutic actions.[1,2]


PRODUCTION OF OLIVE LEAF EXTRACT
Harvest (Leaf Collection)
Extraction and production of liquid Olive Leaf Extract
For dry product – Drying stage
Standardisation and testing

The information contained in this section is intended to provide an overview of some of the evidence that exists for olive leaf extract. For more information, and to locate full research papers please subscribe to the Olive Wellness Institute - **http://olivewellnessinstitute.org/**

ANTIOXIDANT ACTIVITY

Olive leaf extract is a potent natural antioxidant. Traditional references and scientific research demonstrates the antioxidant capacity of olive leaf extract.[3,4] In 2007, published research showed that olive leaf extract had one of the highest free radical-scavenging activities of 55 medicinal herbs tested, including green tea and milk thistle.[5] (Other herbs that ranked highly (along with olive leaf extract were Cimicifuga racemosa root/rhizome (Black cohosh), Rheum palmatum root/rhizome (Chines rhubarb), Glycyrrhiza (licorice root) glabra root and Scutellaria lateriflora (blue skullcap)).

In vitro and animal studies have also demonstrated that oleuropein, one of the key biophenols found in olive leaf extract, acts to reduce Low-Density Lipoprotein (LDL) oxidation.[6,7]

ANTIMICROBIAL AND ANTIVIRAL ACTIVITY

Olive leaf extract has been researched for its antimicrobial and antiviral activity:

- In vitro and animal studies show that olive leaf extract has some potential activity against the influenza virus.[8]
- Research suggests that olive leaf extract may reduce the infectivity and inhibit the replication of viruses that cause colds, influenza and lower respiratory tract infections – further clinical trials in humans are needed to validate these findings.[8]
- Olive leaf extract has been shown to stimulate phagocytosis – which may enhance the body's response to a viral infection.[8]
- Gargling olive leaf tea may alleviate symptoms of a sore throat – potentially due to a reduction of inflammation and viral infectivity.[8]

Over the past 10 years, in vitro research has demonstrated that olive leaf extract is effective against a wide range of pathogens.[9,10-17] Specifically, oleuropein has been shown to have invitro antibacterial activity against some gram-positive and gram-negative human pathogenic bacterial strains.[11]

Despite the antimicrobial effect of specific biophenols found in olive leaf extract, research shows that the antimicrobial activities of the combined phenolics has a similar or better effect than any one individual biophenol.[18] To date, there are no human clinical trials which evaluate the effect of olive leaf extract against pathogens for common infections.

OLIVE LEAF EXTRACT AS AN ANTIMICROBIAL AGENT IN FOOD

A review published in 2017 focused on the available literature over the past 40 years associated with the antimicrobial effect of *O.europaea L.* derived extracts and compounds in-vitro and in food matrices, to evaluate the applicability as an antimicrobial food ingredient.

Interestingly, defined extracts of olive fruit and olive leaf have potential as food preservation ingredients – extracts containing considerable quantities of hydroxytyrosol, oleacin, or oleocanthal have strong antimicrobial activity.[19]

INSULIN SENSITIVITY

A randomised, double-blinded, placebo-controlled, crossover trial in New Zealand (published in 2013) assessed the effects of supplementation with olive leaf polyphenols (51.1 mg oleuropein and 9.7 mg hydroxytyrosol) on insulin action and cardiovascular risk factors in overweight middle-aged men at risk of metabolic syndrome.[20] Twelve weeks of supplementation with olive leaf poylphenols significantly improved insulin sensitivity and pancreatic ß-cell secretory capacity.[20]

OLIVE LEAF AND THE METABOLIC SYNDROME

A 2017 review article summarized the available evidence from dietary intervention trials relating to consuming polyphenol-rich olive products (olive leaves, crude olive leaf extract, extra virgin olive oil) and the amelioration of aberrant glucose metabolism, high blood pressure and elevated lipids.[21]

It was found that olive polyphenols have convincing evidence (in dietary intervention trials) of reducing risk factors for metabolic syndrome, in particular by improving blood sugar and blood pressure control, and in reducing LDL oxidation. However, only limited evidence suggests the effects on weight reduction and improved lipid profiles.[21]

CANCER

Various anti-cancer effects of olive leaf extract are reported in the evidence – such as in breast cancer, colorectal cancer, chronic leukemia and prostate cancer.[21-24] In vitro research shows that the phytochemicals in olive leaf extract inhibit cancer and endothelial cell proliferation.[25] Further clinical trials in humans are needed to validate these findings.

HEART HEALTH

Published research demonstrates the effects of olive leaf extract for heart health:

- A 2008 paper assessed the effects of olive leaf extract to reduce blood pressure in borderline hypertensive monozygotic twins. Results confirmed the anti-hypertensive and lipid-lowering effects of olive leaf extract.[26]
- A 2014 double-blind, placebo controlled cross-over human dietary intervention trial evaluated the effects of regularly consuming a combination of olive leaf, green coffee bean and beetroot extracts on blood pressure, arterial compliance, blood lipids, blood glucose and insulin sensitivity.[27] Results showed that there was no significant effect on any outcome measures tested.
- A randomised controlled trial published in 2017 has demonstrated that phenolic-rich olive leaf extract had hypotensive and lipid-lowering effects.[28]
- Olive leaf extract has also been shown to improve vascular function in human research.[29]

OLIVE LEAF AND THE SKIN

There are various skin care products available which contain olive leaf ingredients (e.g. typically as olive leaf or olive extract).

- Research on healthy volunteers (2008) assessed the cosmetic properties of oleuropein, the major biophenol found in the olive leaf, against UVB-induced erythema.[29] Results showed that oleuropein formulations were able to reduce erythema, trans-epidermal water loss and blood flow.
- In 2010, published research assessed the effects of olive leaf extract (and oleuropein) on acute UVB irradiation-induced skin changes in mice.[30] Results showed that olive leaf extract reduced skin-thickening as well as inhibited breakdown of skin tissue caused by ultraviolet radiation.
- In vitro research (2011) demonstrated that olive leaf extract can protect against skin cancer (inhibiting cell reproduction and inducing early apoptosis).[31]

- A 2011 study evaluated the effects of olive leaf extract on would healing using in vivo wound models. Results showed that the extract demonstrated wound healing activity, due to antimicrobial and antioxidant features.[32]
- An experimental study in 2014 looked at the effects of olive leaf extract on skin wound healing in aged male mice.[33] Results showed that oleuropein accelerated wound healing.

OLIVE LEAF AND ORAL MUCOSITIS

The effects of olive leaf extract on oral mucositis, a common complication of intensive cancer chemotherapy and radiotherapy, has also been investigated.[34,35] In severe cases of this condition secondary infection can occur, leading to further health complications for patients. Oral mucositis lesions are often infected with bacteria and fungi that can lead to delayed healing times.[35] Olive leaf extract and benzydamine HCL (a common antimicrobial treatment for oral mucositis) was tested against various bacterial and fungal isolates representative of the complex environment found in the oral cavity.[34] Olive leaf extract was shown to have bactericidal, but not bacteriostatic activity against bacterial species tested. When compared with benzydamine HCL, olive leaf extract showed a higher antimicrobial activity, especially against fungal species.

The effects of topical application of olive leaf extract for oral mucositis has also been assessed in golden hamsters, to evaluate overall healing properties.[35] Results showed that daily application of olive leaf extract ointment was effective in the treatment of oral mucositis. The beneficial effects of olive leaf extract in this case are likely associated with a variety of actions, such as a reduction in the inflammatory response, increased collagen concentration, increased fibers' stabilisation and antimicrobial activity. The authors hypothesized that the antimicrobial properties of olive leaf extract could reduce the impact of microorganisms in oral mucositis and hence have a beneficial effect.

A study published in 2014, assessed the in vitro antimicrobial efficacy of Mediterranean natural plant extracts (including olive leaf extract) against oral microorganisms.[36]

Methanol extracted olive leaf extract (with 60% oleuropein) and table olive extract (the water extract from table olive processing) were tested against ten bacteria (including eight species found in the oral flora) and one strain of *C. albicans*. Overall, olive leaf extract was shown to be less active than the table olive extract and showed a milder inhibitory effect on oral pathogens. Olive leaf extract was especially effective against gram-negative anaerobic periodontal pathogens (P. *gingivalis, P. inermedia* and *F. nucleatum*). This infers a potential opportunity for olive leaf extract in the treatment of such infections, as gram-negative microorganisms typically demonstrate resistance to conventional antimicrobial drugs.[36] The results of this study showed some promising opportunities for olive leaf extract as a natural anti-microbial agent for the treatment of periodontal disease.

Given that *C. albicans* is one of the most common yeast organisms found on human mucosal membranes, further research has investigated the antifungal effects of olive leaf extract against this microroganism.[37] A paper by Nasrollahi et al., used invitro studies to assess the effects of aqueous olive leaf extracts from Iran against *C. albicans*. They showed that olive leaf extract did had antifungal activity against this species, confirming previous research findings. Hence, olive leaf extract may be a suitable option for the treatment or prevention of conditions caused by *C. albicans*, such as oral thrush.

In addition to the therapeutic areas covered in this section, there is also evidence related to other health conditions and olive leaf, such as in – bone health, inflammatory conditions and neurodegenerative diseases.

For more information, please visit:
www.olivewellnessinstitute.org/olive-leaf/olive-leaf-extract/
and
www.olivewellnessinstitute.org/olive-science/#olive-science-database

OLIVE LEAF TEA

Olive leaf tea is one of the most common, traditional herbal teas used among Mediterranean people to treat disease.[38] It has been used for centuries for the treatment of conditions and diseases such as the common cold, malaria and tropical illnesses.[39]

Research shows that components of the olive leaf (most prominently, oleuropein) may have beneficial effects on health – such as benefits for hypertension, cardiovascular disease, diabetes and hyperlipidaemia.[38–40]

Research related to the specific health benefits of olive leaf tea is limited, and presents an opportunity for interested researchers, to grow and develop this area of evidence. However, there is an abundance of evidence around the bioactive components found in the olive leaf, as previously | detailed in the **Olive Leaf Extract** section of this booklet.

TROPICAL OLIVE LEAF EXTRACT SMOOTHIE RECIPE

INGREDIENTS

1 frozen banana

½ cup mixed berries

½ mango peeled

½ cup pineapple

1/2–1 teaspoon Chia seeds

1 Cup (235 mL) almond milk /water or milk of your choice

Lime or lemon juice

15 mL Olive Leaf Extract

DIRECTIONS

Place all ingredients in a blender until smooth

MORE INFORMATION

For more information, and to stay updated in olive science please subscribe to the Olive Wellness Institute™ – **www.olivewellnessinstitute.org**

REFERENCES

1. Vogel P, Machado I, Garavaglia J, et al. Polyphenol benefits of olive leaf (Olea europaea L.) to human health. Nutr Hosp. 2015;31(3):1427–33.

2. Ali Hashmi M, Hanif M, Farooq U, et al. Traditional uses, phytochemistry and pharmacology of Olea europaea (Olive). Ev Based Complement Alternat Med. 2015; doi:10.1155/2015/541591.

3. Lee O, Lee B. Antioxidant and antimicrobial activities of individual and combined phenolics in Olea europaea leaf extract. Bioresor Technol. 2010; 101:3751-4.

4. Umeno A, Takashima M, Murotomi K, et al. Radical-scavenging Activity and Antioxidative Effects of Olive Leaf Components Oleuropein and Hydroxytyrosol in Comparison with Homovanillic Alcohol. J Ole Sci. 2015; 64:7;793-800

5. Wojcikowski K, Stevenson L, Leach D, et al. Antioxidant capacity of 55 medicinal herbs traditionally used to treat the urinary system: a comparison using a sequential three-solvent extraction process. J Altern Complement Med 2007;13:103-109.

6. Coni E, Di Benedetto R, Di Pasquale M, et al. Protective effect of oleuropein, an olive oil biophenol, on low density lipoprotein oxidizability in rabbits. Lipids 2000;35:45-54. 24.

7. Pieroni A, Heimler D, Pieters L, et al. In vitro anticomplementary activity of flavonoids from olive (Olea europaea L.) leaves. Pharmazie 1996;51:765-768.

8. Roxas M. Jurenka J. Colds and Influenza: A review of diagnosis and conventional, botanical and nutritional considerations. Alt Med Rev. 2007.2(1):25-48.

9. Lee O, Lee B. Antioxidant and antimicrobial activities of individual and combined phenolics in Olea europaea leaf extract. Bioresour Technol. 2010;101:3751–4.

10. Sudjana A, D'Orazio C, Ryan V, et al. Antimicrobial activity of commercial Olea europaea (olive) leaf extract. Int J Antimicrob Agents. 2009;33:461–3.

11. Omar S. Oleuropein in olive and its pharmacological effects. Sci Pharm. 2010;78:133–54.

12. Malik S. Antibacterial activity of olive (Olea europaea) leaves and arugula (Eruca sativa) seeds extract. IJPPR. 2015;7(2):307–10.

13. Altemimi A. A study of the protective properties of Iraqi leaves against oxidation and pathogenic bacteria in food applications. Antioxidants (Basel). 2017;6(2): pii: E34. doi: 10.3390/antiox6020034.

14. Shah F, Hasan Z, Zaidi K. Phytochemical constituents and synergistic activity of Olive leaf extracta Europaea plant extracts against some human disease-causing species. 2017. J Microbiol Exp. 4(5): 00127.

15. Debib A, Boukhatem N. Phenolic content, antioxidant and antimicrobial activities of "Chemlali' olive leaf (Olive leaf extracta europaea L.) extracts. Int J Pharmacol Phytochem Ethnomed. 2017;6:38–46.

16. Hussain A, Qarshi I, Liaqat R, et al. Antimicrobial potential of leaf and fruit extracts and oils of wild and cultivated edible olive. Pak J Bot. 2014;46(4):1463–8.

17. Halawi M, Rahman S, Yusef H. Comparative study of the antifungal activity of Olive leaf extracta europaea L. against some pathogenic Candida albicans isolates in Lebanon. Int J Curr Microbiol App Sci. 2015;4(6):970–84.

18. Lim A, Subhan M, Jazayeri J, et al. Plant phenols as antibiotic boosters: in vitro interaction of olive leaf phenols with ampicillin. Phytother Res. 2016;30(3):503–9.

19. Thielmann J, Kohnen S, Hauser C. Antimicrobial activity of Olea europaea Linne extracts and their applicability as natural food preservative agents. Int J Food Microbiol. 2017; 251:48–66.

20. de Bock M, Daerraik J, Brennan C, et al. Olive (O l e a e u r o p a e a L.) Leaf Biophenols Improve Insulin Sensitivity in Middle-Aged Overweight Men: A Randomized, Placebo-Controlled, Crossover Trial. 2013; 8(3):1-8.

REFERENCES (CONTINUED)

21. Boss A, Bishop S, Marlow G, et al. Evidence to Support the Anti-Cancer Effect of Olive Leaf Extract and Future Directions. Nutrients. 2016;8:513.

22. Milanese S, Bigdeli M, Rasoulian B, et al. The effect of olive leaf extract on antioxidant enzymes activity and tumor growth in breast cancer. Thrita. 2014;3(1): doi: 10.5812/thrita.12914

23. Cardeno A, Sanchez-Hidalgo M, Rossillo M, et al. Oleuropein, a Secoiridoid Derived from Olive Tree, Inhibits the Proliferation of Human Colorectal Cancer Cell Through Downregulation of HIF-1α. Nutr Cancer. 2013;65(1):147–56.

24. Samet I, Han J, Jlaiel L, et al. Olive (Olea europaea) Leaf Extract Induces Apoptosis and Monocyte/Macrophage Differentiation in Human Chronic Myelogenous Leukemia K562 Cells: Insight into the Underlying Mechanism. Oxid Med Cell Longev. 2014; :927619. doi: 10.1155/2014/927619.

25. Goulas V, Exarchou V, Troganis A, et al. Phytochemicals in olive-leaf extracts and their antiproliferative activity against cancer and endothelial cells. Mol Nutr Food Res. 2009;53(5):600–8.

26. Perrinjaquet-Moccetti T, Schmidlin C, et al. Food supplementation with an olive (Olea europaea L.) leaf extract reduces blood pressure in borderline hypertensive monozygotic twins. Phytother Res. 2008 Sep;22(9):1239-42.

27. Wong R, Garg M, Wood L, et al. Antihypertensive potential of combined extracts of olive leaf, green coffee bean and beetroot: A randomized, double-blind, placebo-controlled crossover trial. Nutrients. 2014;6:4881–94.

28. Lockyer S, Rowland I, Spencer J, et al. Impact of phenolicrich olive leaf extract on blood pressure, plasma lipids and inflammatory markers: a randomised controlled trial. Eur J Nutr. 2017; 56(4):1421-1432.Perugini P, Vettor M, Rona C, et al. Efficacy of oleuropein against UVB irradiation: preliminary evaluation. In J Cosmet Sci. 2008. 30: 113–120. doi:10.1111/j.1468-2494.2008.00424.x

29. Sumiyoshi M, Kimura Y. Effects of olive leaf extract and its main component oleuroepin on acute ultraviolet B irradiation?induced skin changes in C57BL/6J mice. Phytother Res. 2010;24(7):995–1003.

30. Mijatovic S, Timotijevic G, Miljkovic J. Multiple antimelanoma potential of dry olive leaf extract. Int J Cancer. 2011;128(8):1955–65.

31. Koca U, Süntar I, Akkol EK, Yilmazer D. Wound Repair Potential of Olea europaea L. Leaf Extracts Revealed by in vivo Experimental Models and Comparative Evaluation of the Extracts' Antioxidant Activity. J Med Food. 2011 Jan-Feb;14(1-2):140-6.

32. Mehraein F, Sarbishegi M, Aslani A. Evaluation of effect of oleuropein on skin wound healing in aged male balb/c mice. Cell J. 2014;16(1):25–30.

33. Ahmed K, Talabani N, Altaei T. Olive Leaf Extract as a New Topical Management for Oral Mucositis Following Chemotherapy: A Microbiological Examination, Experimental Animal Study and Clinical Trial. Pharmaceut Anal Acta. 2013;4:9.

34. Showraki N, Mardani M, Emamghoreishi M, et al. Topical olive leaf extract improves healing of oral mucositis in golden hamsters. J Demt Shiraz Univ Med Sci. 2016;17(4):334–42.

35. Karygianni L, Cecere M, Skaltsounis A, et al. High-level antimicrobial efficacy of representative Mediterranean natural plant extracts against oral microorganisms. Biomed Res Int. 2014; doi. org/10.1155/2014/839019.

36. Nasrollahi Z, Abolhasannezhad M. Evaluation of the antifungal activity of olive leaf aqueous extracts against Candida albicans PTCC-5027. Curr Med Mycol. 2015;1(4):37–9.

37. Lockyer S, Corona G, Yaqoob P, et al. Secoiridoids delivered as olive leaf extract induce acute improvements in human vascular function and reduction of an inflammatory cytokine: a randomised, doubleblind, placebo-controlled, cross-over trial. Br J Nutr. 2015 Jul 14;114(1):75-83.

38. Sedef N, Karakaya S. Olive tree (Olea europaea) leaves: potential beneficial effects on human health. Nutr Rev. 2009;67(11):632–8.

39. Olive Leaf Extract. Alt Med Rev. At: http://www.altmedrev.com/publications/14/1/62.pdf

40. Natural therapy pages. Olive leaf tea. At: https://www.naturaltherapypages.com.au/article/the_health_benefits_of_olive_leaf_tea#gM2cRvjZiePVlVdD.97